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A new species of the fangblenny *Adelotremus* from Indonesia, with supplemental description of *A. leptus* (Teleostei: Blenniidae: Nemophini)

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Abstract

A new fangblenny, *Adelotremus deloachi*, is described on the basis of three specimens, 29–35 mm SL, from Bali and Lembeh Strait, Indonesia. All these specimens were collected in 10–17 m depth on sandy slopes. The new species differs from *Adelotremus leptus*, its Red Sea and only congener, in having a pair of mid-dorsal supratemporal pores (vs. a single pore), dorsal-fin spines X (vs. IX) and precaudal and caudal vertebra 12 + 23 (vs. 13 + 19). The discovery of a second species requires slight modification of the diagnosis of the genus. Unlike the five other nemophine genera, *Adelotremus* differs most notably in having the third infraorbital bone and associated sensory pores absent, and the combination of ventral margin of gill opening opposite the dorsalmost 5th or 6th pectoral-fin ray, total dorsal-fin elements 28–29 and interorbital pores 2. With a total of four specimens of *Adelotremus*, it is now apparent that several features of the cephalic pore arrangement of the genus are different from that found in *Petroscirtes*, its presumed sister genus. Recent color photographs indicate that both species of *Adelotremus* exhibit marked sexual dichromatism with males having a conspicuous ocellus anteriorly in the dorsal fin that is absent in females.

Key words: taxonomy, Pisces, Blenniidae, *Adelotremus*, new species

Introduction

The sabertooth or fangblenny genus *Adelotremus* Smith-Vaniz & Rose, the sixth valid blenniid genus of the tribe Nemophini, was described (Smith-Vaniz & Rose 2012) from a single 34.5 mm SL female of *A. leptus* Smith-Vaniz & Rose, collected from the Red Sea near Sharm el Sheikh, Egypt in July 2011. The present paper describes a second species of *Adelotremus* that was first discovered by underwater photographer Ned DeLoach while diving near Tulamben, Bali, in Indonesia during April 2012. A specimen was subsequently collected from the same site by Mark Erdmann of Conservation International, and two additional specimens were obtained by DeLoach during November 2016 at Lembeh Strait, North Sulawesi Province.

Characters of the two species of *Adelotremus* and of *Petroscirtes* Rüppell, the genus they most closely resemble, are contrasted in Table 1. The addition of a second species of *Adelotremus* requires slight modification of the diagnosis of the genus. Description of *A. deloachi* increases the total number of species of nemophine blenniids to 56.

Materials and methods

Type specimens are deposited in the United States National Museum of Natural, Washington, D.C. (USNM) and the Museum Zoologicum Bogoriense, Cibinong, Java, Indonesia (ZMB). Measurements and counts follow Smith-Vaniz (1976). Measurements were taken with needle-point digital calipers and recorded to the nearest 0.1 mm. Number and shapes of infraorbital bones were determined by dissection.

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Taxonomy

Diagnosis of *Adelotremus*. A genus of nemophine blennies with dorsal-fin spine pterygiophores broadly contacting robust neural spines; only 3 infraorbital bones with corresponding absence of posterior infraorbital pores adjacent to where the missing infraorbital bone would normally be present; ventral margin of gill opening flap opposite 5th or 6th dorsalmost pectoral-fin ray; total vertebrae 32–35.

Remarks. The original diagnosis of the genus (based solely on the holotype of *Adelotrema lepus* Smith-Vaniz and Rose) included description and illustrations of the dorsal-fin spine pterygiophores that broadly contact the robust neural spines (Smith-Vaniz & Rose 2012, figs. 2–3A). Although a clear x-ray of the holotype of *A. deloachi* could not be obtained, virtually identical configuration of these bones to those of *A. leptus* can be seen on digital x-rays of the two paratypes. Two of the original diagnostic characters of *Adelotremus* require slight modification: the total number of vertebrae for the genus is increased by three, with the range now 32–35; in the female holotype of *A. leptus* a simple cirrus was associated only with the anterior 1 or 2 dentary sensory canal pores but recent photographs of two *A. leptus* males (Figs. 5–6) show cirri associated with most of (probably all) the dentary pores and several of the preopercular pores.

Adelotremus deloachi new species

Spotfin fangblenny

Figures 1–4; Table 1

Holotype. ZMA 23004, 32.0 mm SL, male, Indonesia, Bali, off Seraya, ca. 8°17'20"S, 115°36'26"E, on sand slope in 17 m, collected with clove oil and hand-net, Mark V. Erdmann, 26 April 2012.

Paratypes. ZMA 23208, 29.4 mm SL, female, Indonesia, Lembeh Strait, "Aer Bajo One" dive site, 1°28'52"N, 125°15'11"E, on black sand slope in 10–12 m, collected with plastic bag, Ned DeLoach, 17 November 2015; USNM 438965, 34.9 mm SL, male, same data as female paratype.

Diagnosis. A species of *Adelotremus* distinguished from its only known congener, *A. leptus*, by the following characters: Dorsal-fin spines X (vs. IX); vertebrae 12 + 23 (vs. 13 + 19); and mid-dorsal supratemporal pores 2 (vs. 1). Males have a conspicuous blue ocellus between dorsal-fin spines that is absent in females.

Description. Where counts differ, those of the holotype are given first, followed by the larger (male) and smaller (female) paratypes. Dorsal fin X, 19; last ray broadly attached by membrane to caudal peduncle; first spine with small flap on anterior margin, length of spine slightly shorter than second spine, and with spines 2–4 subequal in length. Anal fin II, 19; last ray broadly attached by membrane to caudal peduncle. Caudal fin with 6 procurrent rays (3 dorsal + 3 ventral), 11 segmented rays (6 dorsal + 5 ventral), all rays unbranched and outermost dorsal and ventral soft ray elongate; hypural 5 absent; epurals 1. Pectoral-fin rays 13 (both sides). Pelvic fin I, 3. Vertebrae: precaudal 12 + caudal 23; dorsal-fin spine pterygiophores broadly contacting neural spines (see Smith-Vaniz & Rose 2007, figs. 2–3A). Posteriomost epineurals and pleural ribs on vertebra 13. Upper and lower jaws each with posterior recurved canines (premaxillary canines much smaller than dentary canines) on each side. Incisor teeth broad based and firmly attached, 30 (30, 29) in upper jaw and 26 (30, 28) in lower jaw. Cranial bones ornamented with numerous small pits. Dentaries connected by a tight interdigitating joint at ventral midline. Infraorbital bones 3, including dermophenotic; second infraorbital slender, elongate and tapering to a point posteriorly (see Smith-Vaniz & Rose 2012, fig. 4A); wide gap between second infraorbital and dermosphenotic indicating the loss of an infraorbital, which corresponds to absence of infraorbital pores in postorbital region of head (Fig. 4). Gill opening with lateral flap only; ventral margin of gill opening opposite level of dorsalmost 5th or 6th pectoral-fin ray. The cephalic sensory pore system includes 3 dentary pores, 5 preopercular pores, 3 ventral infraorbital pores and the absence of posterior infraorbital pores, 1 pair of interorbital pores, 3 supratemporal pores (mid-dorsal pair and 1 lateral), and 3 posttemporal pores. No lateral-line tubes or associated pores present. Each mid-dorsal supratemporal pore has a minute cirrus, the last posttemporal and the 1st dentary pores each have a well-developed, slender cirrus; no cirri are associated with the preopercular and supraorbital pores and there is no orbital cirrus. Anterior nostril consists of a very short tube without a small flap on posterior margin; posterior nostril with only a slightly raised rim. Swim bladder absent.

Proportions of the 32.0 mm SL male holotype are given first, followed by the male and then female paratypes (in parentheses) as percent SL: Standard length in mm 32.0 (34.9; 29.4); head length 23.4 (24.1; 25.5); eye

diameter 7.2 (7.4; 8.3); preanal length 51.2 (49.9; 55.1); dorsal-fin length 80.0 (81.9; 79.6); anal-fin length 44.4 (43.1; 39.8); depth at anal-fin origin 11.1 (11.4; 11.4); longest outer caudal-fin rays, upper 31.6 (23.8; 25.5) and lower 24.7 (21.8; 30.5); inner caudal-fin ray 18.1 (16.9; 18.1); pelvic fin 7.0 (5.9; 7.3); length of first dorsal-fin spine -- (14.6, 8.8); second spine 12.8 (18.6, 11.6); third spine 13.8 (21.8, 12.4) forth spine 13.4 (21.8, 12.4), spine length measurements only approximate because of small size and curvature of spines. Measurements of the single female and two males suggest that the heights of the anterior dorsal-fin spines are sexually dimorphic, which is not too surprising because males have a prominent ocellus anteriorly on the dorsal fin that is absent in females.

Life coloration (Figs. 1–3). The most striking feature of the life coloration is the prominent ocellus of males. The ocellus is almost as large as the eye, has a narrow white ring, and is mostly confined to membrane of first two spines; the ocellus is oblong (shape and ocellus width influenced by relative spread of dorsal fin, compare Figs. 1 and 3 of presumably the same individual), and appears black or bright blue depending on light conditions; except for the ocellus, membranes of first three dorsal-fin spines are golden olive, and 3rd spine bordered by narrow white margin; ground color of remainder of the dorsal fin of males light brown, and segmented rays with small, alternating, dark brown and white spots. In contrast to males, the dorsal fin of females anteriorly is densely and uniformly brown speckled and the segmented rays lack alternating spots. Other features of the coloration are a brown to black mid-lateral stripe, approximately width of pupil, extending from snout through middle of eye to base of caudal fin; stripe slightly expanded in front of gill opening; remainder of body varying from mostly white ventrally to tan and speckled with various shades of brown, including series of about eight light blotches; pelvic fin white; and iris golden brown.

In alcohol-preserved specimens the color pattern, except for the ocellus of males, is essentially the same as in life, consisting of the brown stripe, and speckles and blotches of various shades of brown.

TABLE 1. Selected characters of the genus *Petroscirtes* and the two species of *Adelotremus*[1]

Characters[1]	*Petroscirtes* spp. (n = 11 species)	*Adelotremus leptus* (n = 1 specimen)	*Adelotremus deloachi* (n = 3 specimens)
Gill opening ventral margin	entirely above pectoral fin	opposite level of dorsalmost 5th or 6th pectoral-fin ray	like *A. leptus*
Dorsal-fin spine pterygiophores	not broadly contacting neural spines	broadly contacting neural spines	like *A. leptus*
Infraorbital bones	4	3 (3rd infraorbital absent)	like *A. leptus*
Posterior infraorbital pores	present 3–4	absent	like *A. leptus*
Interorbital pores	4	2	like *A. leptus*
Preopercular pores	6 (pores series continuous)	5 (not continuous, wide gap between dorsalmost pore and the others, see Fig. 4)	like *A. leptus*
Mid-dorsal supratemporal pores	1 or 2	1	2
Lateral line tubes or pores	present	absent	like *A. leptus*
Orbital cirri	present or absent	absent	like *A. leptus*
Dorsal fin spines	10–12	9	10
Dorsal fin segmented rays	14–21	19	like *A. leptus*
Anal fin segmented rays	14–21	19	like *A. leptus*
vertebrae (caudal /precaudal)	11–13/19–25	13/19	12/23
Pectoral fin rays	13–16	13	like *A. leptus*
Premaxillary incisors in adults	26–45	26	29–30
Dentary incisors in adults	28–48	27	26–30

[1]Cephalic pore terminology follows Smith-Vaniz (1976, fig.1); also see figs. 10–13 for cephalic pore configuration in representative species of *Petroscirtes.*

FIGURE 1. *Adelotremus deloachi* holotype, ZMA 23004, male, 32.0 mm SL, Bali, Indonesia. Photograph by Ned DeLoach.

Distribution. Known only from Bali and Lembeh Strait but undoubtedly more widely distributed in Indonesia.

Etymology. This new species is named *Aledotremus deloachi* in honor of Ned DeLoach in recognition and appreciation of his books, magazine articles and photographs that celebrate the beauty and diversity of reef fishes, all of which have encouraged numerous divers and fish watchers to become more aware of the importance of protecting the threatened marine environment and fauna.

Remarks. Discovery of a second new species of *Adelotremus* from Indonesia began while Ned DeLoach was conducting underwater fish photography in April 2012 at the Seraya dive resort near Tulamben, Bali, Indonesia. Ned was heading down a slope at a site known as Big Tree, located less than five minutes west of the resort, when he noticed a small pencil-thin blenny, with its beautiful dorsal fin fully spread, sticking halfway out of a hole on the sandy substrata in 16 m (52 ft.). Because the fish was so close when first seen, it spooked and disappeared down into its hole. Ned patiently waited for 40 minutes about one meter from the hole before the small blenny reappeared far enough out of the hole to get a good photograph (Fig. 1). Realizing that the fish was unusual, Ned sent the photographic image to several ichthyologists but none of them could identify the blenny. Ned mentioned that the dive guides had returned to check on him several times because he had remained for such a long time at the same site while trying to photograph the blenny, and therefore they would probably remember the exact location. Mark

FIGURE 2. *Adelotremus deloachi* paratype, USNM 438965, female, 29.4 mm SL, Lembeh Strait, Indonesia. Photograph by Ned DeLoach.

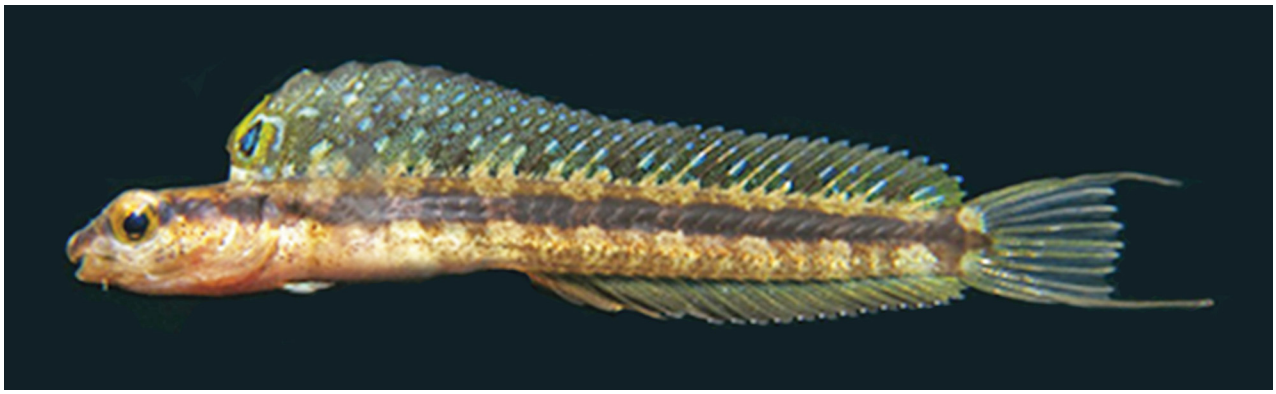

FIGURE 3. *Adelotremus deloachi* holotype, (right side reversed). Photograph by Mark V. Erdmann.

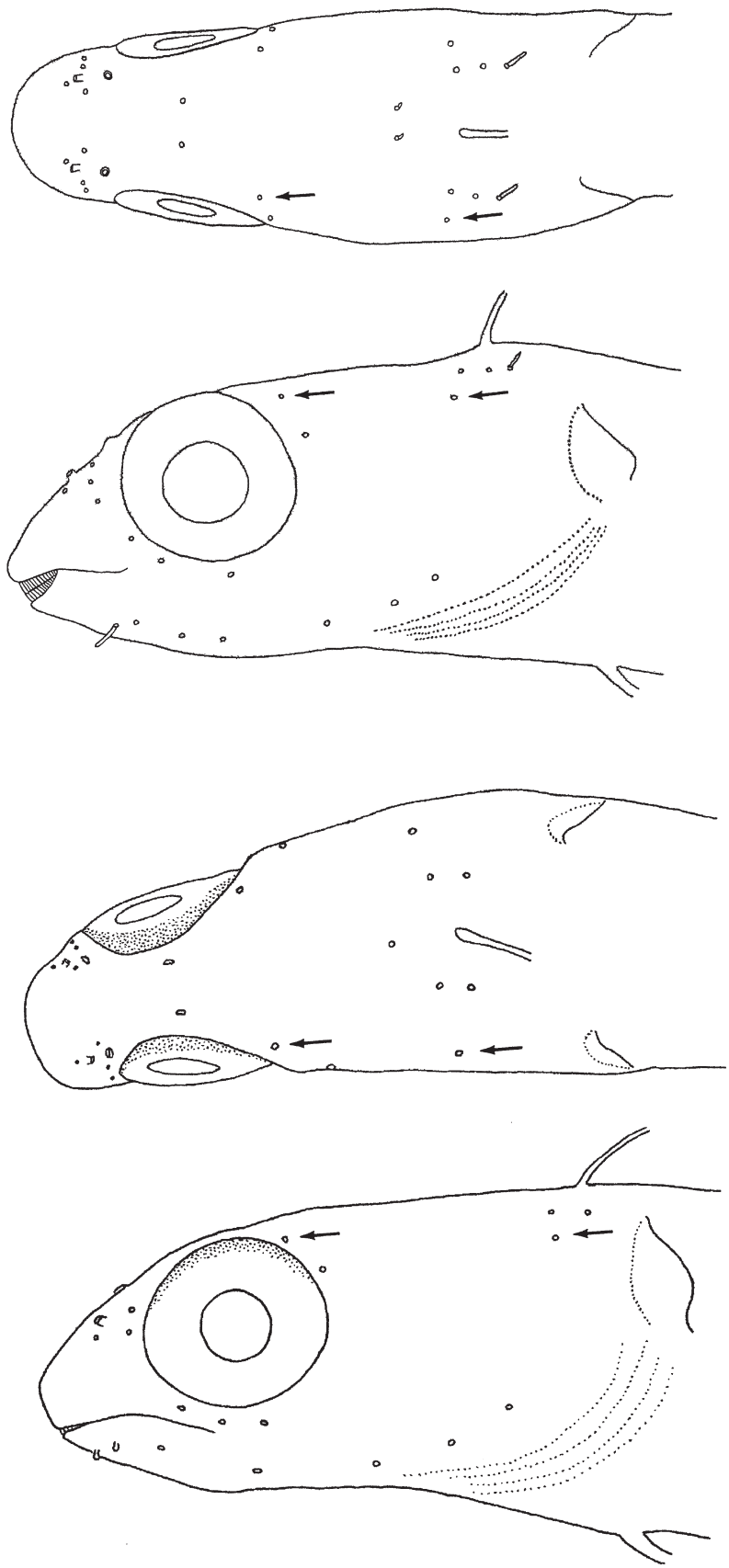

FIGURE 4. Cephalic sensory pores in species of *Adelotremus*: (above) *A. deloachi*, holotype, male, 32.0 mm SL, ZMA 23004, Bali, Indonesia; (below) *A. leptus*, holotype, female, 34.5 mm SL, ZMA 23004, Red Sea, Egypt, modified from Smith-Vaniz and Rose (2009, fig. 5). Small arrows identify ventralmost supraorbital and dorsalmost preopercular pores in both lateral and dorsal views.

FIGURE 5. *Adelotremus leptus*, male, close-up of dorsal-fin ocellus, Red Sea, Marsa Abu Dabab, Egypt. Photograph by Bart Hazes.

Erdmann, who then lived in Bali, kindly visited the dive resort at my request during the same month of the initial discovery to try to collect the mystery blenny. With the help of the original dive guides, Mark was able to find and collect with clove oil what was probably the same individual. The dive guides said they believed they had seen the same species only a few other times at different sites and always in the same kind of habitat.

Three individuals of the new species of *Adelotremus* were subsequently observed on 16 November 2015 by Ned and Anna Deloach at Lembeh Strait, Indonesia, on a black sand slope in 10–12 m. The following day Ned returned to the same site and was able to photograph several of the blennies and, with the help of dive guide Abdulrahman Tampilang, collected two specimens, one of each sex. A large zip-lock bag was used to capture the fish when they retreated inside hollow soda-like tubes sticking out of the sand.

Notes on *Adelotremus leptus*. The original description of *Adelotremus leptus* was based on the single female holotype collected from the Red Sea, at Marsa el At (27°54'38"N, 34°19'44"E) near Sharm el Sheikh, Egypt. In June 2015 Bart Hazes discovered this blenny at another Red Sea locality, Marsa Abu Dabab (25.338°N, 34.739°E), in a large central area of silt, sand and seagrass, but no rubble. He noted that this locality "is as close as you get to muck diving in the Red Sea." Only males were observed which, like *A. deloachi*, have a beautiful blue ocellus in the dorsal fin (Figs. 5–6) which is absent in the female holotype. Based on these two photographs, the ocelli shape and coloration are essentially the same if not virtually identical to that in *A. deloachi* (see discussion of ocellus in above color description). Unlike the female holotype, large males of *A. leptus* have cirri associated with some of the more posteriorly positioned mandibular pores and several of the preopercular pores, and also have outer caudal-fin rays that are much more elongate (Fig. 6).

Supratemporal (ST) pores were very difficult to observe and only one lateral temporal (LT) pore could be detected in the holotype even with high magnification; however, after publication of the original description, re-

examination of the holotype with a Zeiss Discovery V12 stereomicroscope revealed a second LT pore that had been previously missed (Fig. 4). More specimens are required to determine if *A. leptus* actually has only two LT pores. In contrast, three LT pores were present in all three specimens of *A. deloachi*.

The slender bodies of the two species of *Adelotremus* are possibly an adaption for utilization of small abandoned worm holes or other protective shelter. Bart Hazes (pers. com.) reported that at Marsa Abu Dabab *A. leptus* occupied empty shells of the scaphopod mollusc genus *Dentalium*.

FIGURE 6. *Adelotremus leptus*, large male, with elongate outer caudal-fin rays, Red Sea, Mars Abua Dabab, Egypt. Photograph by Bart Hazes.

Acknowledgments

Ned DeLoach, New World Publications, Jacksonville, Florida, is thanked for sending his photograph of the holotype of *Adelotremus deloachi* to several ichthyologists in an attempt to have it identified. He subsequently collected two additional specimens of the new species from a different locality and generously made the specimens and their photographs available for my use. Mark V. Erdmann, Conservation International Indonesia, also deserves special thanks for his successful effort to collect and photograph the holotype on short notice. Bart Hazes, University of Alberta, called my attention to the new locality record for *Adelotremus leptus* and generously gave permission to publish his photographs of the species. I am also grateful to Sandra Raredon (USNM) who provided digital radiographs of the new species, and David G. Johnson (USNM) for use of his stereomicroscope to aid in a search for the difficult to observe cephalic pores of the holotype of *A. leptus*; Victor G. Springer (USNM) provided advice on cephalic pore nomenclature and suggested a way to determine the composition of certain pore series. Renny K. Hadiaty (MZB), Robert H. Robins, (University of Florida), Jeff Clayton, Shirleen Smith and Jeffrey T. Williams (USNM) provided curatorial assistance and institutional catalog numbers, and the latter also reviewed an early draft of the manuscript.

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